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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/711,771	10/04/2004	James W. Adkisson	BUR920040110US1	5770
30449 7590 03/12/2007 SCHMEISER, OLSEN & WATTS 22 CENTURY HILL DRIVE SUITE 302 LATHAM, NY 12110			EXAMINER GHYKA, ALEXANDER G	
			ART UNIT	PAPER NUMBER
			2812	
SHORTENED STATUTORY PERIOD OF RESPONSE		MAIL DATE	DELIVERY MODE	
3 MONTHS		03/12/2007	PAPER	

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/711,771

Applicant(s)

ADKISSON ET AL.

Examiner

Alexander G. Ghyska

Art Unit

2812

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) 1-9 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 10-20 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

ALEXANDER GHYKA
PRIMARY EXAMINER

Ar 2812
Alex Ghyska

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04 October 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date ____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date ____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: ____.

Art Unit: 2812

DETAILED ACTION

Election/Restrictions

Applicant's election with traverse in the reply filed on 12/21/2006 is acknowledged. The traversal is on the ground(s) that 1-20 are sufficiently related such that a thorough search for the subject matter of any one group of claims would encompass a search for the subject matter of the remaining claims without serious burden. This is not found persuasive because Claims 1-9 encompass a separately patentable invention, and would require the search of additional areas.

The requirement is still deemed proper and is therefore made FINAL.

Claims 10-20 are now under consideration.

Claim Objections

Claim 15 is objected to because of the following informalities: the word "abut" in the last line. Appropriate correction is required. The word "abut" should be deleted.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of

the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 10-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gardner et al (US 5,936,287).

The present Claims generally require a method of fabricating a semiconductor structure comprising providing a substrate; forming a dielectric layer on a top surface of the substrate; forming a polysilicon layer on a top surface of said dielectric layer; implanting a first portion of the polysilicon layer with N-dopant species, said N-dopant species contained within the polysilicon layer; implanting a second and different portion of the polysilicon layer with P-dopant species, said P-dopant species contained within the polysilicon layer; and implanting the first portion of the polysilicon layer with a nitrogen containing species, said nitrogen containing specie essentially contained within the polysilicon layer.

Gardner et al disclose a nitrogenated gate structure for improved transistor performance. Gardner et al disclose providing a substrate; forming a dielectric layer on a top surface of the substrate; forming a polysilicon layer on a top surface of said dielectric layer. See column 3, lines 6-12. Moreover, Gardner et al disclose implanting a first portion of the polysilicon layer with N-dopant species, said N-dopant species

Art Unit: 2812

contained within the polysilicon layer; implanting a second and different portion of the polysilicon layer with P-dopant species, said P-dopant species contained within the polysilicon layer. See column 4, lines 5-15, and Figures 8-9. Furthermore, Gardner et al disclose implanting the polysilicon layer (including the first portion) with a nitrogen containing species (about 1×10^{16} /cm²) . See column 3, lines 12-15 and column 5, lines 35-40.

Gardner et al differs from the present Claims in that it does not disclose the nitrogen containing species are essentially contained within the polysilicon layer.

It would have been obvious to one of ordinary skill in the art that the nitrogen containing species is essentially contained in the polysilicon layer, as Gardner et al discloses a blanket implant of the polysilicon layer and it would be obvious for one of ordinary skill in the art to optimize the dosage of nitrogen, so that the nitrogen remains essentially in the polysilicon layer and not the dielectric layer underneath. Discovery of an optimum value of a result effective variable in a known process is ordinarily within the skill of the art. See *In re Antonie* 195 USPQ 6 (CCPA 1977). In the present case it would be obvious for one of ordinary skill in the art to optimize the dosage of the ion implant so that the nitrogen species are essentially contained in the polysilicon layer.

With respect to Claim 11, Gardner et al discloses a blanket implant on both section of the polysilicon (both the first and second portions). See column 3, lines 10-15.

With respect to Claims 12-16, Gardner et al does not disclose the implanted nitrogen concentration or relative concentration of N dopant.

It would have been obvious for one of ordinary skill in the art to arrive at the peak concentrations of nitrogen and N-dopant, as arriving at the optimum ranges would have been a matter of optimization, within the level of one of ordinary skill in the art. Where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation. See *Allen v. Coe* 57 USPQ 136. Moreover, discovery of an optimum value of a result effective variable in a known process is ordinarily within the skill of the art. See *In re Antonie* 195 USPQ 6 (CCPA 1977). Since Gardner et al disclose the same dopants in the same devices, optimization of the dopant concentrations would have been within the level of skill of one of ordinary skill in the art.

Claims 17-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gardner et al as applied to claims 10-16 above, and further in view of Wu (US 5,930,617).

Gardner et al is relied upon as discussed above.

However, Gardner et al does not disclose the use of arsenic as the N dopant as required by Claim 17, and the thermal oxidation, etch and silicide formation as required by Claims 18-20.

Wu et al also disclose the formation of CMOS. Wu et al disclose the use of arsenic as an N dopant. See column 4, lines 10-20. Moreover, Wu et al disclose the formation of an oxide, etching to remove a portion of the oxide and formation of a silicide. See column 5, lines 30-50.

Art Unit: 2812

It would have been obvious for one of ordinary skill in the art, at the time of the invention, to use the silicide formation steps of Wu, in the process of Gardner et al, for its known benefit of forming contacts on the gate structures. The use of a known process, forming a silicide, for its known benefit, formation of contacts on gate structures, would have been obvious to one of ordinary skill in the art. As both references are drawn to CMOS transistors, a *prima facie* case of obviousness is established.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alexander G. Ghyka whose telephone number is (571) 272-1669. The examiner can normally be reached on Monday through Friday during general business hours.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Lebentritt can be reached on (571) 272-1873. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.


Art Unit: 2812

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

AGG
March 3, 2007

ALEXANDER GHYKA
PRIMARY EXAMINER

AV 2812

A handwritten signature in black ink, appearing to read "Alex Ghyska", written in a cursive style.